JUMO

More than sensors + automation

Ex Devices

Reliable products for potentially explosive areas
according to EU Directive 2014/34/EU

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Dear Reader,

The expression ATEX is an acronym from ATmosphères EXplosibles, which is French for potentially explosive atmospheres. The abbreviation serves as a short designation for two European directives which refer to sections of the European Treaty:

EU directive 2014/34/EU refers to devices and protective systems intended for operation in potentially explosive atmospheres. It applies to both electrical and mechanical devices. Primarily, this directive is aimed at the manufacturers of devices and plants. It has replaced the previous EU directive 94/9/EC (ATEX).

EU directive 1999/92/EC (ATEX 137) deals with the safety of plants as well as protecting the health and safety of employees who could be endangered by potentially explosive atmospheres. This directive defines the minimum requirements for plant operators who ultimately bear full responsibility. Plant operators are also required to draw up explosion protection documents.

IECEx Certificates of Conformity (IECEx CoC)
As part of the internationalization process, JUMO has begun the process of having the product range certified for the explosion-protected area according to IECEx.

TR TC Ex certification for the Eurasian Economic Union
Within the Eurasian Economic Union (Russia, Kazakhstan, and Belarus) products with the label "Ex" must have proof of conformity with the valid explosion protection directives. This proof is the TR-Ex certificate in accordance with the technical regulations TR CU 012/2011 "On safety of equipment intended for use in explosive atmospheres". Upon request, several JUMO products can be delivered with this certificate.

Project planning/application
Neatly declared components such as those offered by JUMO are highly beneficial in designing measuring circuits for use in potentially explosive areas and creating explosion protection documents. These components give the operator the legal certainty that is essential. They also facilitate cost-optimal, efficient project planning with no ifs, ands, or buts.
Zones with potentially explosive dust atmospheres (dust Ex) require special consideration. We are also able to offer suitable products in this area.

This brochure will give you an overview of our ATEX products. Of course, we are also happy to work with you to create customized solutions for your individual requirements.

In addition, we offer a specialist book and seminar entitled "Explosion Protection in Europe" on the subject of ATEX. For further information go to: **www.jumo.de**.

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ATEX and IECEx identification marking

Potentially explosive areas and zone classification according to EU directive 2014/34/EU

Ex II (1G) [Ex ia]

Ex II (1D) [Ex ia]

Device category

I Mining
II Area susceptible to gas explosion
III Area susceptible to dust explosion

1	Very high level of safety Two independent errors Two redundant protection measures	
1G	Gases, mist, vapors	Zone 0
1D	Dust	Zone 20
2	High level of safety	
2G	Gases, mist, vapors	Zone 1
2D	Dust	Zone 21
3	Normal level of safety	
3G	Gases, mist, vapors	Zone 2
3D	Dust	Zone 22

Zone classification

Gases, mist, vapors	Dust	Potentially explosive atmosphere is present	Equipment Protection Level (EPL) Gases	Dust
Zone 0	Zone 20	Continuously, long-term, or frequently > 1000 hr/yr	Ga	Da
Zone 1	Zone 21	Occasionally > 10 hr/yr ⩽ 1000 hr/yr	Gb + Ga	Da + Db
Zone 2	Zone 22	Rarely and briefly > 0 hr/yr ⩽ 10 hr/yr	Ga, Gb + Gc	Da, Db + Dc

Ignition protection types with the corresponding standards

EN 60079-0 General requirements

Gas

EN 60079-1 d Flameproof enclosure
EN 60079-2 p Pressurized enclosure
EN 60079-5 q Powder filling
EN 60079-6 o Oil immersion
EN 60079-7 e Increased safety
EN 60079-11 ia, ib, ic Intrinsic safety
EN 60079-15 n Non-sparking
EN 60079-18 ma, mb, mc Die-cast enclosure
EN 60079-25 i-Intrinsically safe system Electr. systems

Dust

EN 60079-18 maD, mbD Die-cast enclosure
EN 60079-31 ta, tb, tc Protection by enclosure
EN 61241-4 pD Pressurized enclosure
EN 60079-11 ia, ib, ic Intrinsic safety

Protection level

a Two countable errors simultaneously
b One countable error
c Operation without faults (no errors)

Related electrical apparatus

[... is outside the potentially explosive area.
The signal lines lead into the Ex-area (e.g. supply isolators for transmitters)]

IIC T6 Ga

IIIC T_{150} Da

Explosion groups

I Electrical apparatus for mines susceptible to firedamp (e.g. mining with coal dust, methane gas)

II Electrical apparatus for all areas susceptible to gas explosions except for mines susceptible to firedamp (e.g. chemical industry with dyes, acetylene)

III Subdivision into IIA, IIB, IIC depending on ignitability.

Electrical apparatus for all areas susceptible to dust explosions

- IIIA = Combustible lint
- IIIB = Non-conductive dust
- IIIC = Conductive dust

Temperature classes

Tempera-ture class	Max. surface temperature of the apparatus	Ignition temperature for combustible substances
T1	450 °C	> 450 °C
T2	300 °C	> 300 °C < 450 °C
T3	200 °C	> 200 °C < 300 °C
T4	135 °C	> 135 °C < 200 °C
T5	100 °C	> 100 °C < 135 °C
T6	85 °C	> 85 °C < 100 °C

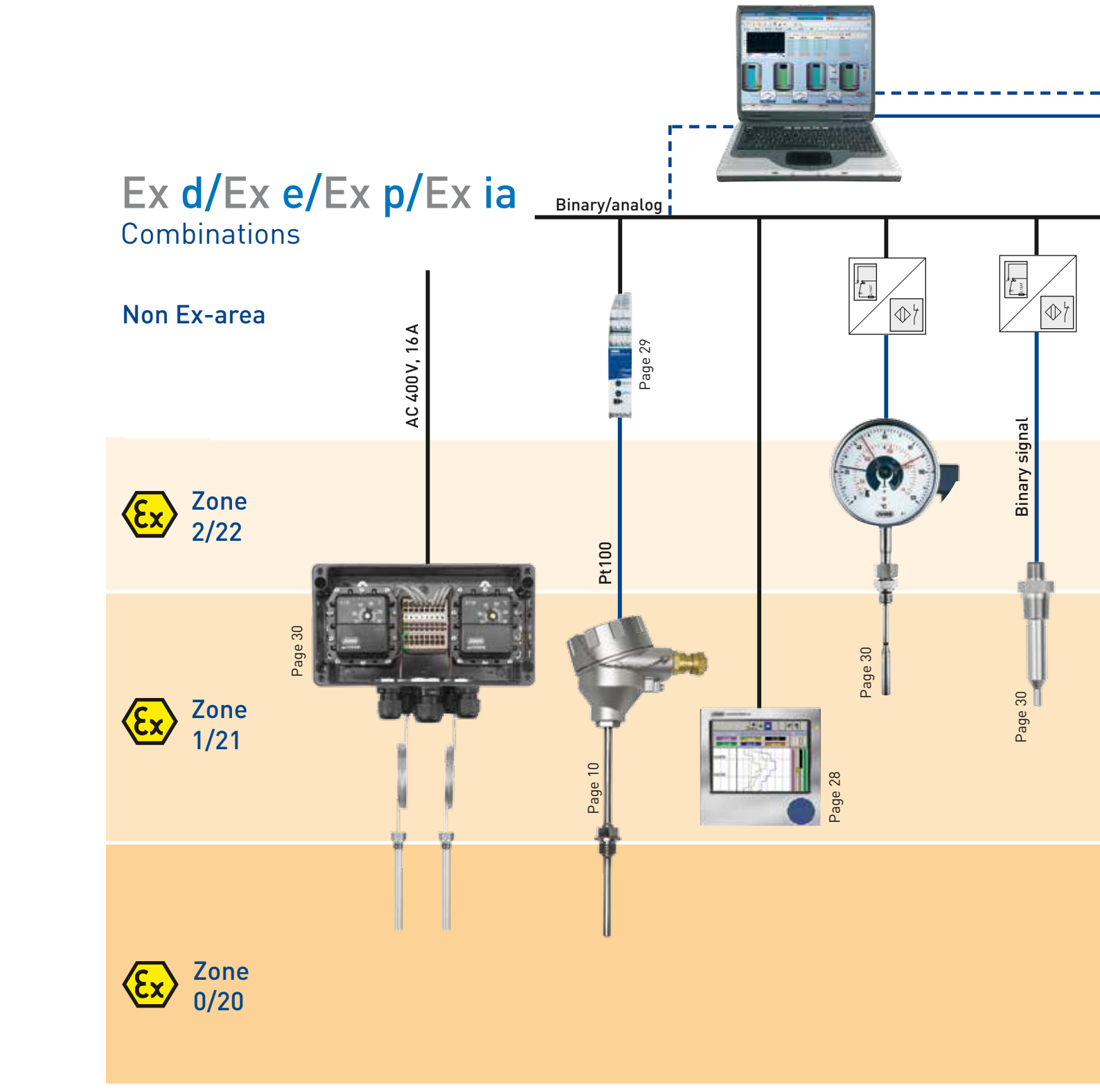
Temperature classes / explosion protection groups
(excerpt)

	T1	T2	T3	T4	T5	T6
I	Methane	–	–	–	–	–
IIA	Acetone Ethane Acetic acid Ammonia Phenol Propane*	Ethyl alcohol n-Butane n-Butyl alcohol	Benzine Heating oil Diesel fuel	Acetal dehyde	–	–
IIB	City gas	Ethyl alcohol Ethylene*	Hydrogen sulfide	Ethyl ether	–	–
IIC	Hydrogen*	Acetylene				Carbon disulfide

*Typical ignitable gas

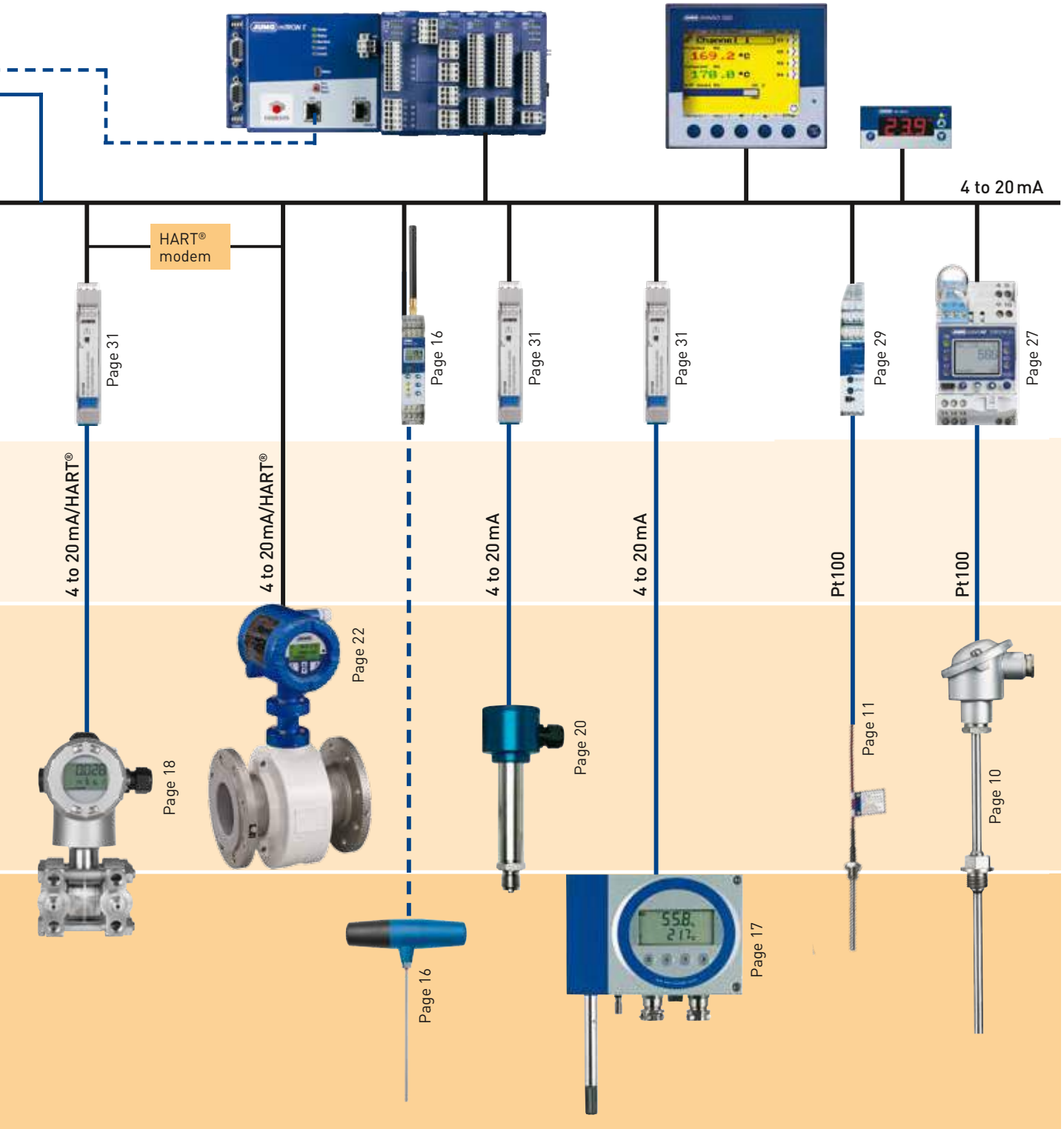
Ex d/Ex e/Ex p/Ex ia

Combinations



Ex Devices

ATEX Sensors Automation



Sensors

Temperature measuring devices

RTD temperature probes are used as intrinsically safe apparatus and/or apparatus with flameproof enclosure for temperature measurements in liquid and gaseous media as well as with dust. Depending on the needs of the application and the measurement task, the RTD temperature probes are available with different terminal heads, various process connections, matching thermowells, LED display modules, with or without zone separation, with or without exchangeable measuring inserts, or with the connecting cable mounted.

RTD temperature probes with ignition protection type Ex "i" are certified for connection to intrinsically safe electrical circuits of category ia/ib (for applications in zones 1 and 2, with separating element in zone 0) and of category ia (for use of the probe tube in zones 0, 1, and 2).

RTD temperature probes in a flameproof enclosure are also fitted with measuring inserts in an intrinsically safe version for connection to intrinsically safe electrical circuits.

Humidity measuring devices

Measuring probes of this intrinsically-safe design series were especially developed for potentially explosive areas and can be installed directly in the Ex-area as a whole unit. In addition, various probe modules provide versatile possibilities for nearly all applications. The intelligent probe module can also be easily removed for calibration purposes or replaced if necessary. Saving all of the calibration coefficients directly in the probe module saves the otherwise time-consuming manual entry. The measuring probe can also remain installed on-site. The calculations of dew point temperature, absolute humidity, mixing ratio, and wet-bulb temperature are possible as options. Last but not least, an LCD display with user keyboard can be integrated. This outstanding feature makes configuration on the measuring probe even easier.

We bring knowledge and experience – you get the security.

Measuring devices for pressure, level, and flow

Measuring pressure, level, and flow are among the most important tasks in almost all sectors of industry.
High-quality measuring devices ensure reliable and safe measuring results regardless of whether you are dealing with high-precision solutions for the process industry, hygienic solutions for the food and pharmaceutical sectors, or universal solutions for mechanical and plant engineering.

Maximum precision and reliability

This is the result of the many years of experience of our qualified employees in development and production. We are familiar with complex interrelationships and therefore see quality as a process to be continuously examined and improved: starting with new product development based on internally manufactured sensors, we safeguard our manufacturing process with the very latest production lines and finally subject each device to a 100 % final inspection.

Flexibility

JUMO develops, tests, and manufactures new products or customer-specific versions internally. Our great manufacturing depth safeguards the quality process and gives us more flexibility, allowing us to pay special attention to customer needs and specific application-oriented features.

Screw-in thermocouples and RTD temperature probes

Type	901820	902820		
Feature	Thermocouple with ceramic protection tube	RTD temperature probe with continuous protection tube, with stepped protection tube (not shown)	RTD temperature probe with continuous protection tube (not shown); with stepped protection tube	RTD temperature probe with thermowell DIN 43767
ATEX/IECEx identification marking	Ⓔx II 2 G Ex ia IIC T1 ... T6 Ga/Gb Ⓔx II 2 D Ex ia IIIC T60 °C ... T400 °C Da/Db	Ⓔx II 1/2 G Ex ia IIC T1 ... T6 Ga/Gb Ⓔx II 1/2 D Ex ia IIIC T60 °C ... T400 °C Da/Db Version for each terminal head Ex d; Ex ia/d, Ex tb		
Further approvals	SIL/PL qualified*			
Temperature range	–100 to +1200 °C	(–200) –50 to +600 °C –100 to +600 °C		
Measuring insert	Type "J", "K", "N", "B", "S"	With/without replaceable measuring insert, as single or double Pt100, Pt500, Pt1000 with and without programmable (Ex "i") head transmitter		
Tolerance class	Class 1/2 according to DIN 43710/60584	B, A, AA (according to DIN EN 60751)		
Connection	–	In two-wire, three-wire, or four-wire circuit		
Terminal heads	Form B (BUZ, BUZH) made of aluminum die-cast, protection type IP54 (IP65)			
	–	Form BBKS made of plastic, protection type IP54, with flameproof enclosure Ex "d", terminal heads with LED display (optional), others upon request		
Protection tube / thermowell	Steel, ceramic C799, KER 610	Protection tube made of stainless steel 1.4571, titanium, Inconel®, HASTELLOY®; with PTFE or HALAR coating	Protection tube made of stainless steel 1.4571, titanium, tantalum, Inconel®, HASTELLOY®; with PTFE or HALAR coating	Thermowell D1/D2, D4 / D5 made of stainless steel 1.4571, steel 1.7335, titanium, tantalum, Inconel®, HASTELLOY®; with PTFE or HALAR coating
Process connection	Flange / screw connection / thread	Screw connection / thread G1/2, G1, NPT, others upon request	Flange, C DN 25, C DN 40 others upon request	Thermowell
Special features	Inspection certificate 3.1 available upon request for material, pressure test, leak test, insulation resistance, electrical tolerance/calibration			

*Depending on the version

RTD temperature probes and thermocouples

Type	902815	902821		
Feature	Compact RTD temperature probe	Screw-in thermometer	Push-in thermometer, push-in mineral-insulated thermometer	Push-in mineral-insulated thermocouple
ATEX/IECEx identification marking	Ⓔx II1/2 G Ex ia IIC T6 Ga/Gb Ⓔx II1/2 D Ex ia IIIC T80 °C Da/Db	Ⓔx II 1/2 G Ex ia IIC T6 Ga/Gb Ⓔx II 1/2 D Ex ia IIIC T80 °C IP65 Da/Db Ⓔx II 2 G Ex e IIC T1 ... T6 Gb Ⓔx II 2 D Ex tb IIIC T60 °C ... T80 °C IP65 Db		
Further approvals	SIL/PL qualified			
Temperature range	–70 to +260 °C	–100 to +260 °C, –100 to +600 °C (mineral-insulated thermometer)		–200 to +1200 °C
Measuring insert	Pt100, Pt1000	Pt100, Pt500, Pt 1000, Pt2000, NTC		Type: "J", "K", "L", "S", "B"
Tolerance class	1/3 DIN class B	B, A, AA (according to DIN EN 60751)		Class 1/2 according to DIN 43710/60584
Connection	Four-wire circuit	Two-wire circuit, three-wire circuit, four-wire circuit		–
Terminal head	M12 connector	Silicone, PTFE, PVC, FEP, Radox®, BETAFLAM®, FPM, PEEK®, or PUR connecting cable (also available with shielding/armoring)		
Protection tube	–	Stainless steel 1.4571, 1.4435, or others upon request		Stainless steel 1.4541
Process connection	Screw connection/ thread G1/2, G1, clamp DN 25/DN 32/DN 40, or others upon request	Various threads	–	
Special features	Without transmitter	For universal application		For universal application, flexible protection tube

Head thermocouples and RTD temperature probes

Type	903510/40	903520/40	903510/50	903520/50
Description	Thermocouple I.T.C., I.T.C 420	RTD temperature probe I.I.R and I.I.R.420	Thermocouple C97 EEX	RTD temperature probe C97 EEX
ATEX/IECEx* identification marking	Ⓔx II 1/1G 1/1D for I.T.C. and I.I.R Ⓔx II 1/1 G 1/2D for I.T.C.420 and I.I.R420 Ex ia IIC T1 to T6 or xxx °C/T6 Ga/Ga Ex ia/tb III CT xxx °C/T85 °C Da/Db		Ⓔx II 2/2 G 1/2 D* Ex e II T1 to T6 or xxx °C/T6 Gb/Gb Ex ta/tb IIIC T xxx °C/T85 °C Da/Db	
Temperature range	–200 to +1300 °C	–200 to +800 °C	–200 to +1300 °C	–200 to +800 °C
Measuring insert	Type "T", "J", "L", "K", "N", thermowell or process connection, sheath cable version	Pt100, Pt1000, NTC, PTC	Type "T", "J", "L", "K", "N", thermowell or process connection, sheath cable version	Pt100, Pt1000, NTC, PTC
Terminal head	Form BUZ 72 Form BUZ 85 Form BUSH Form CNI-3		Form DN AG Form BUZ 85 Form BUSH Form XD-AD	
Protection tube	Solid material or welded version made of steel, stainless steel, nickel alloy, titanium.			
Process connection	Thread, flange, clamp			
Ambient temperature	–40 to +80 °C			
Special features	Approval only in conjunction with an ATEX/IECEx-approved transmitter for I.T.C420 and I.I.R420			

* IECEx version optional

Thermocouples and RTD temperature probes

Type	903510/30	903520/30	903515/40	903525/40
Description	Thermocouple TB.97-XDT/CT	RTD temperature probe TB.97-XDR/CR	Thermocouple TXI.03	RTD temperature probe TXI.03
ATEX/IECEx* identification marking	Ⓔx II 2/2 G Ex d IIC T1 to T6 or xxx°C/T6 Gb/Gb		Ⓔx II 1 G 1 D Ex ia IIC T1 ... T6 Ga Ex ia IIIC T xxx °C Da	
Temperature measuring range	–200 to +1300 °C	–200 to +800 °C	Depending on connecting cable	
Measuring insert	Type "T", "J", "L", "K", "N", thermowell or process connection, sheath cable version	Pt100, Pt1000, NTC	Type "T", "J", "L", "K", "N", thermowell or process connection, sheath cable version	Pt100, Pt1000, NTC, PTC
Terminal head / connecting cable	Form XD-AD Form CNI-3 ADF		PVC –5 to +80 °C PUR –5 to +105 °C Silicone –50 to +180 °C PTFE –50 to +260 °C Extra code: additional protection with metal protection tube	
Transmitter	–		Intrinsic safety according to EN 60079-11	
Protection tube	Solid material or welded version made of steel, stainless steel, nickel alloy, titanium			
Process connection	Thread, flange, clamp		–	
Ambient temperature	–40 to +60 °C max. +80 °C		–	

* IECEx version optional

Special solutions

Type	903515/60	903525/60	903515/50	903525/50
Description	Thermocouple C.D.E	RTD temperature probe C.D.E	Thermocouple Ch.P	RTD temperature probe Ch.P
ATEX/IECEx* identification marking	Ⓔx II 2/2 G – II 1/1 D Ex e II T1 to T6 to xxx °C/T6 Gb/Gb Ex ta IIIC Txxx °C/T85 °C Da/Da		Ⓔx II 2/2 G – II 1/1 D Ex e IIC T1 to T6 or xxx °C/T6 Gb/Gb Ex ta IIIC Txxx °C/T85 °C Da/Da Class I, zone 1, AEx e IIC Gb T6 Class I, div 2, groups A, B, C, D	
Further approvals	–		CSA/UL	
Cable entry	Certificate II 2GD – Ex e II according to EN 60079-7		Certificate II 2GD – Ex e II according to EN 60079-7	
Temperature measuring range	–200 to +1300 °C	–200 to +800 °C	–200 to +1300 °C	–200 to +800 °C
Measuring insert	Type "T", "J", "L", "K", "N", thermowell or process connection, sheath cable version	Pt100, Pt1000, NTC, PTC	Type "T", "J", "L", "K", "N", thermowell or process connection, sheath cable version	Pt100, Pt1000, NTC, PTC
Connecting cable	PVC –5 to +80 °C PUR –5 to +105 °C Silicone –50 to +180 °C PTFE –50 to +260 °C Extra code: additional protection with metal protection tube			
Protection tube	Solid material or welded version made of steel, stainless steel, nickel alloy, titanium.			
Process connection	Thread, flange, clamp		–	
Ambient temperature	–20 to +60 °C			
Special features	–		Certificate II 2GD – Ex e II according to EN 60079-7 and EN 60079-31	

* IECEx version optional

Type	903530	903540
Description	Multipoint RTD temperature probe (silo monitoring)	Hot-point RTD temperature probe
ATEX identification marking	⟨Ex⟩ II 1 D - Ex ta IIIC T85 °C Da	⟨Ex⟩ II 2/2 D - Ex tb IIIC T... °C/T85 °C Db/Db
Position	Different versions for mounting on a concrete slab or internal and external metallic construction	–
Temperature measuring range	5 to 80 °C	–20 to +440 °C
Measuring insert	Pt100, Pt1000, NTC, measuring insert replaceable	
Connecting cable	PVC –5 to +80 °C Extra code: additional protection with metal protection tube	M12 connector
Protection tube	Polypropylene: - Diameter Ø = 17 mm - Protection tube, 24 wires made from galvanized steel - Inner protection tube: polyamide Stainless steel 1.4301: - Diameter Ø = 15 mm - Protection tube, 75 wires made from stainless steel - Inner protection tube: PVDF	Solid material or welded version made of steel, stainless steel, nickel alloy, titanium
Special features	For specific version Certificate II 2 D – Ex t II according to EN 60079-31	–

RTD temperature probes for wireless data transmission

Type	902930/15/17/55
Description	JUMO Wtrans transmitter T03
ATEX identification marking without zone separation	Ⓔx II 1 G Ex ia IIB T4 Ga Ⓔx II 1 D Ex ia IIIB T130 °C Da
ATEX identification marking with zone separation	Ⓔx II 1/2 G Ex ia IIB T4 Ga/Gb Ⓔx II 1/2 D Ex ia IIIB T130 °C Da/Db
Further approvals	cULus, IC, FCC
Special features	- For mobile or stationary temperature measurement - Wiring expenses are eliminated with modern wireless technology - Fail-safe transmission with telegram coding
Transmission frequency	868.4 MHz (Europe); 915 MHz (USA, Australia, Canada, New Zealand, and other countries), 10 frequencies can be configured in the 915 MHz frequency band
Transmission interval	Adjustable from 1 to 3600 s Default setting for basic type 902930/15, 902930/17, and 902930/55 = 20 s adjustable via DIP switch to 5 s, 10 s, 20 s, or 45 s
Open air range	Up to 300 m when using the antenna wall mounting holder for the receiver and 3 m antenna cable
Transmitter detection (transmitter ID)	Five-digit ID, set per default Customer-specific configuration also possible
Measurement input	Pt1000 according to DIN EN 60751, in three-wire circuit
Protection type	IP67 according to DIN EN 60529 (for basic type 902930/55 *)
Lithium battery	Voltage: 3.6 V; rated capacity: 2.2 Ah / 1.7 Ah

Type	902931
Description	JUMO Wtrans receiver
Special feature	Receiver must be placed in non Ex-area
Approval	cULus, IC, FCC
Input	Wireless signal from transmitters
Accuracy	0.1 %
Output	(0)4 to 20 mA 0 to 10 V relay
Frequency	868.4 (Europe)/ 915 MHz (USA/ Canada)
Range	Up to 300 m when using the antenna wall mounting holder for the receiver and 3 m antenna cable
Voltage supply	AC 110 to 240 V AC/DC 20 to 30 V

* Only with screwed-on machine connector M12 × 1

Industrial measuring probe for humidity and temperature

Type	907025
Description	Intrinsically safe industrial measuring probe for humidity, temperature, and derived variables
ATEX identification marking	Ex II 1 G EEx ia IIC T4 Ga Ex II 1 D IP65 T=70 °C Da (with protective cover)
Measuring ranges	Humidity: 0 to 100 % RH Temperature: –40 to +180 °C (depending on the probe selected)
Output variables	RH + T, optionally rF + T + Td + a + Tw + x
Measuring output	4 to 20 mA, (optionally two channels)
Voltage supply	DC 15 to 28 V (via zener barrier or Ex "i" supply isolator)
Design type/protection type	- For wall mounting (907025/61) - With small sensor head on 2 m sensor line (907025/63) - With stainless steel sensor head on 2 m sensor line (907025/65) - With flameproof stainless steel sensor head on 2 m sensor line for process pressures from 0 to10 MPa (100 bar) (907025/64) - With flameproof stainless steel sensor head on 2 m sensor line for process pressures from 0 to 4 MPa (40 bar), sensor head with movable threaded fitting (907025/68)
Enclosure / protection type	G-AlSi10Mg/IP66 (NEMA 4X)
Humidity measurement method	Capacitive
Probes	Universally replaceable (without recalibration) All calibration coefficients are saved in the probe itself
Operating temperature (probe)	–40 to +60 °C (907025/61), –40 to +120 °C (907025/63) –40 to +180 °C (907025/65), –40 to +180 °C (907025/64) –40 to +180 °C (907025/68)
Application	Pharmaceuticals, petrochemicals, food
Special features	Second analog output 4 to 20 mA; housing with display/operator panel; addition: derived variables; probes with cable length 2, 5, or 10 m; various protective filters and accessories

Process pressure transmitters

Type	404382	404385	403022
Description	JUMO dTRANS p02 DELTA	JUMO dTRANS p02	JUMO dTRANS p20 DELTA
ATEX identification marking	Ex II 1/2G Ex ia IIC T6 Ga/Gb		Ex II 1G Ex ia IIC T4 Ga Ex II 1D Ex ia IIIC T105 °C Da
Further approvals	–		INMETRO
Measuring range (measuring span) min./max.	Differential pressure 60 mbar / 25 bar	Relative, absolute 100 mbar / 600 bar	Differential pressure 10 mbar / 600 bar
Accuracy	0.1 %		0.07 %
Measuring output	4 to 20 mA (two-wire), additionally HART®		4 to 20 mA (two-wire), additionally HART®
Voltage supply	DC 11.5 to 36 V		DC 11.5 to 36 V
Ambient temperature	–50 to +85 °C		–50 to +85 °C
Design type / protection type	IP65 field housing according to EN 60529, aluminum		IP67 field housing according to EN 60529, stainless steel
Process connection	2 × ¼-18NPT internal thread or with pressure separator	Various threads or front-flush connections	2 × ¼-18NPT internal thread or with pressure separator
Electrical connection	Cable fitting		Cable fitting or round plug M12 × 1
Medium temperatures	Max. +100 °C	Max. +120 °C Optional max. +200 °C	Max. +110 °C
Application	Level, flow, process pressure	Level, process pressure	Level, flow, process pressure
Special features	Various accessories, complete selection of pressure separators, programming via keypad / LCD display or PC setup program	Pressure connection also front flush, various accessories, complete selection of pressure separators, programming via keypad / LCD display or PC setup program	Various accessories, complete selection of pressure separators, programming via rotary knob / LCD display or PC setup program

Type	403023	403025	403026
Description	JUMO dTRANS p20 DELTA Ex d	JUMO dTRANS p20	JUMO dTRANS p20 Ex d
ATEX identification marking	Ⓔx II 1/2G Ex d IIC T6 ... T4 Ga/Gb Ⓔx II 2D Ex t IIIC T105 °C Db	Ⓔx II 1/2G Ex ia IIC T6 ... T3 Ga/Gb Ⓔx II 1/2D Ex ia IIIC T105 °C Da/Db	Ⓔx II 1/2G Ex d IIC T6 ... T4 Ga/Gb Ⓔx II 1/2D Ex t IIIC T105 °C Da/Db
Further approvals	INMETRO	INMETRO, NEPSI, EHEDG, DNV	INMETRO
Measuring range (measuring span) min./max.	Differential pressure 10 mbar / 100 bar	Relative/absolute 600 mbar / 600 bar	
Accuracy	0.07 %	0.05 %	
Measuring output	4 to 20 mA (two-wire), additionally HART®		
Voltage supply	DC 11.5 to 36 V		
Ambient temperature	–50 to +85 °C		
Design type / protection type	IP67 field housing according to EN 60529, stainless steel		
Process connection	2 × ¼-18NPT internal thread or with pressure separator	Various threads or front-flush connections	
Electrical connection	Cable fitting	Cable fitting or round plug M12 × 1	Cable fitting
Medium temperatures	Max. +110 °C	Max. +120 °C Optionally max. +200 °C	Max. +115 °C
Application	Level, flow, process pressure	Level, process pressure	
Special features	Various accessories, complete selection of pressure separators, programming via rotary knob / LCD display or PC setup program	Pressure connection also front flush, various accessories, complete selection of pressure separators, programming via rotary knob / LCD display or PC setup program	

Pressure transmitters

Type	404710	404753
Description	JUMO MIDAS S21 Ex Pressure transmitter	JUMO dTRANS p33 Pressure transmitter
ATEX identification marking	Ex II 2G Ex ib IIC T6 ... T4 Gb	
	Ex II 2D Ex ib IIIC T70 °C ... T100°C Db	Ex II 1/2 D Ex ia IIIC T60°C ... T100°C
Further approvals	–	Met. certificate
Measuring range (measuring span) min./max.	Relative, absolute 0.25 to 100 bar	Relative, absolute 0.25/600 bar
Accuracy	0.3 %	0.5 %
Measuring output	4 to 20 mA (two-wire)	
Voltage supply	DC 16 to 28 V	DC 11 to 28 V
Ambient temperature	–40 to +85 °C	
Design type / protection type	Stainless steel case IP65 according to EN 60529	
Process connection	Various threads or front-flush connections	
Electrical connection	Attached cable, M12	Cable socket, attached cable, M12, terminal head
Medium temperatures	–40 to +85 °C	–40 to +85 °C Optionally –40 to +200 °C
Application	Process pressure, level	
Application	Oil, fuel, natural gas, painting plants / robots, process engineering, chemistry	Hygienic applications in the food and pharmaceutical industry

Level probes

Type	404753	404393
Description	JUMO dTRANS p33 Level probe	MAERA S29 SW Level probe
ATEX identification marking	II 2G Ex ia IIC T6 ... T4 Gb II 1G Ex ia IIB T6 ... T4 Da	In development
Further approvals	Met. certificate	GL
Measuring range (measuring span) min./max.	Relative 0.25/10 bar	Relative, absolute 0.1/10 bar
Accuracy	0.5 %	0.3 %
Measuring output	4 to 20 mA (two-wire)	
Voltage supply	DC 11 to 28 V	DC 16 to 28 V or DC 21 to 24 V
Ambient temperature	0 to 50 °C	
Design type / protection type	Stainless steel case IP68 according to EN 60529	Titanium case IP68
Process connection	Threads, open/closed system	G1/2" front-flush with protective cap
Electrical connection	Attached cable made from PE; cutting ring fitting for protection tube	Attached cable made from FEP
Medium temperatures	0 to 50 °C	
Application	Level	
Special features	Connection to protection tube for zone 0	–
Applications	All level applications in the Ex-area	Ballast tanks in the shipbuilding industry, wastewater in splash water containers, swimming pool technology in mediums containing chloride

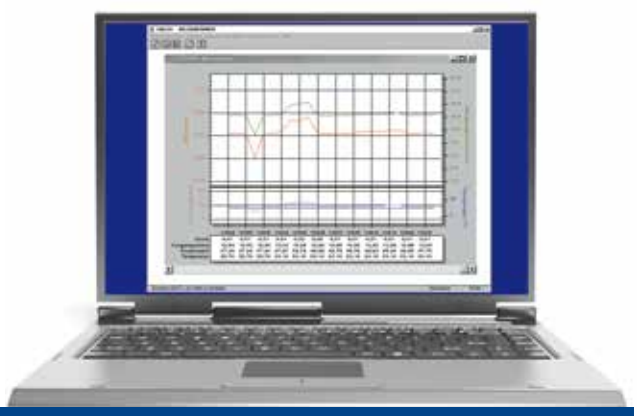
Electromagnetic flowmeters

Type	406012/406013	406015/406016
Description	JUMO flowTRANS MAG S01/S02	JUMO flowTRANS MAG H01/H02
Identification marking ATEX/IECEx	At preparation stage	
Further approvals	–	FDA compliant
Nominal widths	DN 3 to DN 2000	DN 1 to DN 100
Nominal pressure	PN 10 to PN 40	
Measuring accuracy	0.4/0.3 % (optionally: 0.2 %) of the measured value	
Process connections	Flange according to DIN EN, ASME	Screw connection according to DIN 11851, welded socket according to DIN 11850, Tri-Clamp according to DIN 32676, and ASME BPE, connection flange, further flange versions upon request
Process connection material	Steel, stainless steel	Stainless steel 1.4404 with EPDM seal
Lining material	PFA, ETFE, PTFE, hard or soft rubber	PFA (vacuum proof)
Measuring electrode material	1.4571, 1.4539, HASTELLOY® C-4, titanium, tantalum, platinum-iridium	1.4571, 1.4539, HASTELLOY® C-4, tantalum (others upon request)
Maximum medium temperature	130 °C (more upon request)	≤ 130 °C (short-term 150 °C)
Inputs/outputs	Current output 4 to 20 mA, pulse, switching output/input	
Communication	HART® (standard), PROFIBUS-PA	
Protection type	IP67 (NEMA 4X), IP68	
Voltage supply	AC 100 to 230 V AC/DC 24 V	

Convenient operation with minimal effort

JUMO setup program for the HART® interface

Parameterizing a device with the setup program



Recording measured values

JUMO dTRANS p02
Process pressure transmitter
Type 404385

JUMO dTRANS p20
Process pressure transmitter
Type 403025

Startup in just a few easy steps

You can perform startup quickly and easily with the rotary knob or the membrane keys. The devices are also easy to operate at any time in the Ex-area. And you do not even have to open the housing to do it.

A few essential device features:

- Clear LCD display as standard
- High accuracy and stability
- Low temperature drift
- Variable setting on the device means reduced stockkeeping
- Wide temperature range
- Sturdy aluminum or stainless steel case

Our setup programs offer numerous functions for operation via interface:

- Convenient parameterization for all device parameters
- Device parameters can be saved or printed for project documentation
- Actual values and device status are displayed clearly online
- Pressure measurement value and sensor temperature can be recorded and documented for an extended period of time
- All status messages are displayed in plain text

Automation

Recording, automation, and monitoring

Life in our modern industrial society is shaped by the rapid progress of technology. Each step of progress requires an increase in safety at the same time. Explosion hazards exist in many industries, not just in the petrochemicals sector. These industries in particular must make selective use of explosion-protected products and perform associated measures because of the seriousness of possible accidents. JUMO offers innovative products for this purpose for reliable monitoring of machines and plants.

To be able to reach the full potential of your core expertise in mechanical and plant engineering efficiently, you need an expert partner to cover the safety-relevant aspects of measurement and control technology, including explosion protection. Always in touch with the latest trends, we develop and produce a range of products to cover all requirements placed on modern explosion-protected measurement and control technology. Our expertise lies in controlling and regulating electrical energy in potentially explosive environments. JUMO products reflect the latest state of the art. They stand for safety, reliability, and innovation in a challenging market that is constantly changing with new requirements. Extensive quality control measures also ensure the high standard of our products. This process demonstrates time and again: our products always measure and control thermal processes reliably, even under extreme environmental conditions.
Continuous contact with customers who use our products

Maximum plant availability and optimum process reliability

allows us to respond to new demands with pinpoint accuracy in a challenging business segment. This way we can supplement our products with custom-fit new developments.

Certified temperature measuring chain

Up to SIL 3 with JUMO safetyM

Safety temperature limiters / safety temperature monitors with temperature sensor for functional safety – also for use in Ex-areas

- Safe monitoring and switch-off of temperature processes
- Functional safety up to SIL 3
- Performance level up to PL e
- Simple to configure and individually adjustable to the respective application
- Explosion-protected variant according to ATEX directive
- Broad spectrum of temperature sensors available (thermocouples and RTD temperature probes)

With the JUMO safetyM device JUMO now has a wide variety of temperature probes available in its product range. Along with the manufacturer's declaration JUMO delivers a certified safety system with which the most diverse measuring tasks, with the respectively matching sensors, can be carried out safely without requiring additional SIL calculations.

JUMO GmbH & Co. KG

Herstellererklärung

Manufacturer's declaration

Für das folgende Produkt

For the following product

Gegenstand / *Object*: ATEX – Einschraub-Widerstandsthermometer mit Anschlusskopf, Pt 100

Hersteller / *Manufacturer*: JUMO GmbH & Co. KG, Fulda

Typ / *Type*: 902826/10-403-1013-1-9-160-104-26/331,362

Teilenummer / *Part number*: 00406927

Wir erklären als Hersteller, dass die folgende Kombination aus dem oben genannten Temperaturfühler zusammen mit dem SafetyM – STB / STW 70.1155 in einer sicherheitsrelevanten Anwendung in den Sicherheitsstufen SIL 2 oder SIL 3 bzw. Performancelevel d oder e eingesetzt werden dürfen. Voraussetzung ist die Beachtung der Bedingungen und Sicherheitshinweise in den Safety-Manuals.

We declare as manufacturer, that the following combination of above – mentioned temperature probe and the SafetyM – temperature limiter / temperature monitor 70.1150 in a safety – relevant application of security level SIL 2 or SIL 3 or performance level d or e can be used. Requirement is the attention of the conditions and safety instructions in the safety – manuals.

Diese Bescheinigung darf nur unverändert weiterverbreitet werden.

This certificate may only be reproduced in unchanged form.

Datum / *Date*: 24.03.2014

Stempel / *stamp*: JUMO GmbH & Co. KG

Im Auftrag / *by order*: WIB Schmidt

Safety temperature limiters/monitors and two-state controllers

Type	701155	701055
Description	JUMO safetyM STB/STW Ex	JUMO exTHERM-DR
ATEX identification marking	One sensor variant Ⓔx II (1) (2) (3) G (b1) [Ex ia Ga] [e pz] IIC Ⓔx II (1) (2) (3) D (b1) [Ex ia Da] [p Dc] IIIC Two sensor variant Ⓔx II (1) (1) (2) G (b2) [Ex ia Ga] [e py] IIC Ⓔx II (1) (1) (2) D (b2) [Ex ia Da] [p Db] IIIC	Ⓔx II (1) G [Ex ia Ga] IIC Ⓔx II (1) D [Ex ia Da] IIIC
Further approvals	GL, DIN, DGRL, SIL 3, PL e, IPL 2	–
Analog inputs	Thermocouple: type "L", "J", "U", "T", "K", "N", "S", "R", "B", "D", RTD temperature probe: Pt100, Pt1000, current (4 to 20 mA) freely configurable	
Analog outputs	0 to 20 mA, 4 to 20 mA, 2 to 4 V, 0 to 10 V can be used as actual value output for main measured value, measured value 1, 2, differential	0 to 20 mA, 4 to 20 mA, 2 to10 V, 0 to 10 V Analog output configurable as output for actual value, setpoint value, or logic output 0/10 V
Digital input	One floating contact for unlocking, keyboard lock, level inhibit	
Relay outputs	KV – can be used as pre-alarm Alarm – limit alarm evaluated for temperature limiter	Two limit value alarms, one as control output
Voltage supply	AC/DC 20 to 30 V, 48 to 63 Hz, AC 110 V 240 V +10 % /–15 %, 48 to 63 Hz	
Protection type	IP20 according to EN 60529	
Mounting site	Outside the Ex-area	
Transmission behavior	Temperature-linear	
Operation	LCD display for plain text display	

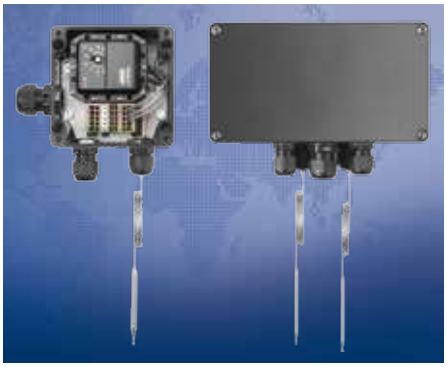
Paperless recorders

Type	706581	706585
Description	JUMO LOGOSCREEN nt With stainless steel front	JUMO LOGOSCREEN fd With stainless steel front
ATEX identification marking	Ⓔx II 2G Ex px IIC Ⓔx II 2D Ex px IIIC	
Further approvals	cULus, Met. certificate	cULus
Modular hardware concept	Up to 18 internal analog inputs, up to 24 binary I/O, additionally up to 54 external analog inputs and binary I/O as well as 18 math and logic channels	
Operation	Via sensor control panel	
Interfaces on the rear	RS232/485 (Modbus), ETHERNET, two USB connections, RS232 (barcode reader), PROFIBUS-DP (optional)	
Mounting site	The device is suitable for installation in control cabinets with pressurized enclosure. Under these conditions, use in a potentially explosive area (zone 1 or 21) is admissible from the front.	
Batch reports	Up to three batches can be recorded simultaneously and independent of each other	
Special features	27 counters/integrators, web server with online-visualization, stainless steel front with laminated glass panel	27 counters/integrators, web servers with online visualization, stainless steel front with laminated glass panel, FDA-compliant according to Title 21 CFR – Part 11, horizontal recorder image

Temperature transmitters

Type	707025	707015	707016
Description	JUMO dTRANS T02 Ex	JUMO dTRANS T01 Ex	JUMO dTRANS T01 HART®/Ex
ATEX identification marking	Ⓔx II (1) G [Ex ia Ga] IIC Ⓔx II (1) D [Ex ia Da] IIIC	Ⓔx II 1G Ex ia IIC T6	Ⓔx II 1G Ex ia IIC T6/T5/T4 Ⓔx II 2G Ex ia IIC T6/T5/T4
IEC Ex identification marking	[Ex ia Ga] IIC [Ex ia Da] IIIC	Ex ia IIC T6...T4 Ga	–
Further approvals	Met. certificate		
Inputs	Thermocouple, Pt100, Pt500, Pt1000, resistance transmitter, potentiometer, current (–20 to +20 mA), voltage (–10 to +10 V)	Thermocouple: type "L", "J", "U", "T", "K", "E", "N", "S", "R", "B", "D", "C", Pt100, Pt500, Pt1000, Ni100, Ni500, Ni1000, in two-wire, three-wire, or four-wire circuit	
Outputs	0 to 20 mA, 4 to 20 mA, 0 to 10 V, 2 to 10 V	4 to 20 mA	
Voltage supply	AC/DC 20 to 53 V, AC 230 V ±10 %	DC 8 to 30 V with reverse voltage protection	DC 11.5 to 30 V with reverse voltage protection
Operating temperature	–10 to +60 °C	–40 to +85 °C	
Storage temperature	–10 to +70 °C	–40 to +100 °C	
Housing width	22.5 mm	∅ 44 mm	
Protection type	IP20 according to EN 60529	IP54 in the terminal head, open mounting IP00 according to EN 60529	
Mounting site	Outside the Ex-area	In the Ex-area	
Transmission behavior	Temperature-linear, customer-specific linearization		
Operation	Fine adjustment via device keys, device configuration via setup program	Completely configurable via setup program	Completely configurable via setup program with HART®-modem
Special features	Galvanic isolation between measuring input, output, and auxiliary voltage, compact design	Flexible application possibilities with free configuration and galvanic isolation, output simulation	Communication in Ex-area via HART®communicator

Electromechanical thermostats, contact dial thermometers, and bimetal switches



Type	605055
Description	JUMO exTHERM-AT Explosion protected surface-mounted thermostat
ATEX/IECEx identification marking	Ex II 2G Ex d e IIC T4/T5/T6 Gb Ex II 2D Ex tb IIIC T85 °C/T100 °C/T130 °C Db
Further approvals	SIL 2
Control ranges	Available from –50 to +500 °C
Operating temperature	–55 to +70 °C
Switching capacity on the N/C contact	AC 230 V, 16(2.5) A, cos φ = 1(0.6) optionally AC 400 V, 16 A optionally AC 230 V, 25(4) A, cos φ = 1(0.6)
Switching function	Temperature monitor, safety temperature monitor, safety temperature limiter
Probe diameter	4 to 6 mm
Capillary length	Up to 5000 mm possible
Protection type	IP65 according to EN 60529
Housing material	Polyester (reinforced) stainless steel (optional)
Special feature	Thermowells for zone isolation type 605057

Type	608301	608520
Description	Bimetal temperature switch	Contact dial thermometer
ATEX identification marking	For use only in combination with an Ex i switching amplifier in zone 2/22	
Further approvals	–	Met. certificate
Control ranges	70 to 140 °C	
Operating temperature	120 °C	
Switching capacity on the N/C contact	Switching capacity depends on the Ex i switching amplifier type	
Probe diameter	11.5 mm (standard)	
Protection type	IP67 (standard)	

Accessories: Ex-i supply isolator for Ex-two-wire transmitter and thermowells

Type	707530
Description	JUMO Ex-i repeater power supply / input isolating amplifier
ATEX identification marking	II (1) G [Ex ia Ga] IIC/IIB II (1) D [Ex ia Da] IIIC II 3 (1) G Ex nA [ia Ga] IIC/IIB T4 Gc
Further approvals	SIL 2, UL
Input	0 to 20 mA or 4 to 20 mA
Output	0 to 5 V, 1 to 5 V, 0 to 20 mA, 4 to 20 mA (active/passive)
Voltage supply	AC/DC 24 to 230 V
Operating temperature	–20 to +60 °C
Storage temperature	–40 to +80 °C
Housing width	17.5 mm
Protection type	IP20 according to EN 60529
Mounting site	Outside the Ex-area
Transmission behavior	Linear
Configuration	Via DIP switch
Special features	HART®-compatible

Type	605057
Description	Thermowell
ATEX identification marking	II 1/2 G Ex Ga II 1/2 D Ex Da
Material	CrNi 1.4571
Version	Screw-in Weld-in
Pipe diameter	10 x 1.5 mm
Insertion lengths	100 to 500 mm

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PR 00030 EN/00342341/2016-06-03/V2